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# ALABAMA'S Forest Products Industry: Performance and Contribution to the State's Economy, 1970 to 1980

Wilbur R. Maki, Con H Schallau, Bennett B. Foster, and Clair H. Redmond





**Abbreviations**

**States**

AL	Alabama
AR	Arkansas
FL	Florida
GA	Georgia
KY	Kentucky
LA	Louisiana
MS	Mississippi
NC	North Carolina
OK	Oklahoma
SC	South Carolina
TN	Tennessee
TX	Texas
VA	Virginia
SO	South
US	United States

**Industries**

FPI	Forest Products Industry
LWP	Lumber and Wood Products
PAP	Paper and Allied Products
WF	Wood Furniture

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## Abstract

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Employment and earnings in Alabama's forest products industry, like those of most Southern States, grew significantly between 1970 and 1980. The forest products industry accounted for a larger share of the State's economic base in 1980 than in 1970. Of the 13 Southern States, only 5 had more forest products industry employment than Alabama. Moreover, during this period, the State increased its share of the Nation's forest products industry employment and earnings. Paper and allied products had the highest productivity and experienced the largest increase in productivity between 1972 and 1977.

**Keywords:** Forest products industries, economics (forest products industries), Alabama.

## Preface

Alabama's forest products industry (paper and allied products; lumber and wood products, excluding mobile home manufacturing; and wood furniture manufacturing), like that of most Southern States, experienced significant growth during the 1970's. This resurgence resulted from the increasing size and amount of timber, investment in new plants and equipment, and a growing demand for Alabama's forest products.

This report briefly describes Alabama's forest products industry—its composition, location, evolution, and relation to economic activity elsewhere in the State, the South, and the Nation.

Estimates of employment and earnings shown in this report were derived from U.S. Department of Commerce data. All references to dollar amounts are in constant 1977 dollars.

This is one in a series of reports for each of the 13 Southern States. These reports are companions to an analysis of the changing roles of the forest products industries of the South and the Pacific Northwest.

## Highlights

- Alabama's forest products industry gained in importance between 1970 and 1980. By 1980 it had surpassed fabricated and primary metals to become the State's third most important basic employer.
- The lumber and wood products industry is the largest segment of the State's forest products industry in terms of employment. The paper and allied products industry, however, accounted for more earnings and value added. Although it is the smallest component, wood furniture manufacturing was the fastest growing segment of Alabama's forest products industry during the 1970's in terms of employment and earnings. Lumber and wood products earnings grew slightly faster than those of paper and allied products.
- In 1980, average annual earnings in Alabama's forest products industry was about the same as for the Nation. Growth in Alabama's average earnings, however, exceeded growth for the South as well as for the Nation.

- In 1977, Alabama's forest products industry had the highest productivity (measured in terms of value added minus payroll, per worker hour) of any State in the South. It also experienced the greatest increase in productivity between 1972 and 1977.
- During the 1970's, Alabama increased its share of the Nation's employment and earnings in the forest products industry.
- In 1980, average earnings in Alabama's forest products industry were second highest among the 13 Southern States and about the same as the industry's U.S. average. Between 1970 and 1980, Alabama tied Georgia for third place in terms of growth in average annual earnings per worker.
- Earnings per worker in Alabama's paper and allied products industry were significantly greater than the earnings in the other segments of the forest products industry.
- In 1977, Alabama was one of the South's leading States in terms of value added by the forest products industry. It was second only to Texas for rate of change in value added between 1972 and 1977.

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**The Forest Products  
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**The State's Workforce**

Alabama's estimated full- and part-time workforce in 1980 was comprised of an estimated 1.7 million employees and proprietors (see appendix tables for sources of employment and earnings data). Unlike most Sunbelt States, Alabama's workforce grew slightly slower between 1970 and 1980 than did the national average (21.4 percent versus 22.3 percent). But total earnings—wage and salary payments and proprietorial income—grew faster than the national average. Measured in constant 1977 dollars, the State's earnings increased by 30.6 percent as compared to 27.4 percent for the Nation. As can be seen in the following tabulation, manufacturing, services, State and local government, and retail trade were the State's four largest employer categories.

<u>Employers</u>	<u>Percent of total employment, 1980</u>	
	<u>Alabama</u>	<u>U.S.</u>
Major industries:		
Manufacturing (including forest products industry)	21.80	19.15
Services	15.40	18.22
State and local government	13.82	12.56
Retail trade	12.01	14.18
Nonfarm proprietors	6.32	6.58
Agriculture	6.16	4.39
Wholesale trade	4.33	4.97
Transportation, communication, and public utilities	4.31	4.84
Construction	4.25	4.08
Federal civilian	3.91	2.81
Federal military	3.20	2.30
Subtotal	95.51	94.08
All other industries	4.49	5.92
Total	100.00	100.00



## Components of the State's Economic Base

Along with total employment there is another and perhaps more important way to judge an industry's contribution to Alabama's economy. For the State's economy to grow and develop, it must attract new dollars so residents can buy goods and services produced elsewhere. The industries that export products and services to other States and the world and bring in new dollars constitute the State's economic base. Generally speaking, most manufacturing employment is classified as economic base (or basic); service or residentiary employment (for example, barber shops, realty firms, schools, and local government) is primarily geared to producing for local needs.

Residentiary employment is supported by the economic base. Money flowing in provides income for wage earners and entrepreneurs to spend on locally purchased goods and services. In most cases, the economic growth of a region is dependent on the success of its economic base.

We used the excess employment and excess earnings techniques to identify the industries that comprise Alabama's economic base. This approach accepts the national distribution of employment and earnings among industries as a norm. Any industry with employment or earnings in excess of this norm is considered to be producing for export markets outside the State and is part of Alabama's economic base. The percentage of Alabama's excess employment and earnings served as an indicator of the State's dependency on a particular industry for generating new dollars from outside the State. (Table 2 shows how industry dependency indicators for Alabama were calculated.)

In 1980, ten industries accounted for 93.6 percent of the State's excess employment and 87.2 percent of its excess earnings (see tabulation below). Though these same industries accounted for only a slightly larger share (95.4 percent and 93.1 percent, respectively) in 1970, the change in shares of certain individual industries is noteworthy. Agriculture, and primary and fabricated metals, for example, were less important in 1980 than in 1970. Meanwhile, the forest products industry gained in importance between 1970 and 1980: In terms of basic employment, it replaced the primary and fabricated metals industry as the State's third most important basic industry. Agriculture continued to hold its position. Notice that although agriculture ranked as the State's second most important basic industry in terms of employment, it was a distant fifth in terms of basic earnings.



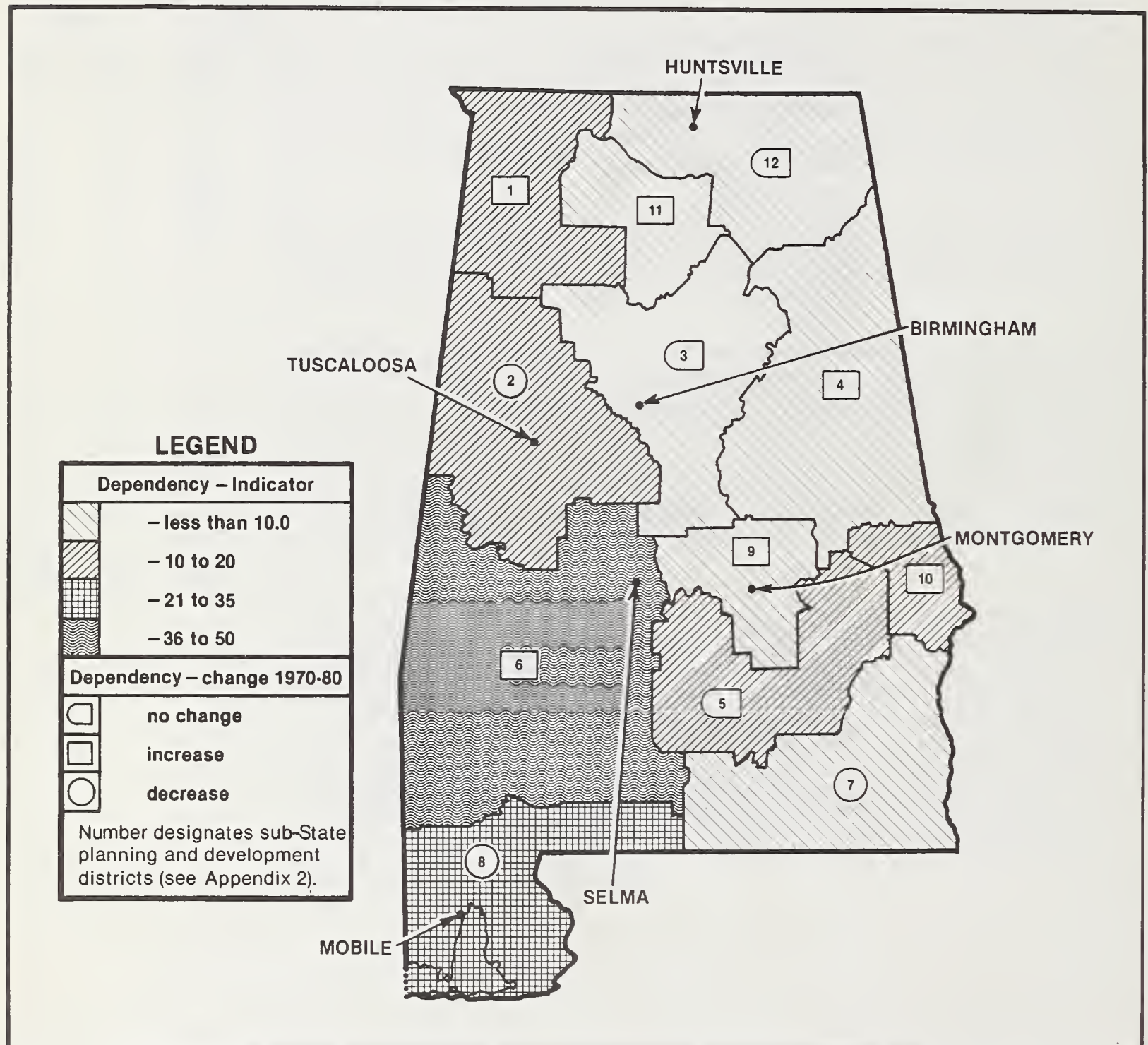
Economic base industries	Dependency indicator <sup>1/</sup>			
	1970		1980	
	EMP	EARN	EMP	EARN
	(Percent of economic base)			
Textile mill and apparel	27.7	20.8	30.5	20.1
Agriculture	24.7	7.7	16.1	6.5
Forest products industry <sup>2/</sup>	11.6	13.4	12.1	15.6
Primary metals	14.4	23.0	10.7	18.4
Federal civilian	8.1	19.8	9.5	16.2
Federal military	8.2	6.4	7.7	3.6
Construction	—	—	2.6	.1
Rubber and miscellaneous plastics	.5	1.6	1.7	4.0
Electrical, gas, and sanitation services	—	.4	1.5	2.7
Food and kindred products	.2	—	1.2	—
Subtotal	95.4	93.1	93.6	87.2
All other basic industries	4.6	6.9	6.4	2.8
Total	100.0	100.0	100.0	100.0

<sup>1/</sup>The indicators of economic dependency are expressed on an employment basis (EMP) and on an earning basis (EARN). For an explanation of the excess employment and other techniques for identifying basic industries, see Edgar M. Hoover. 1975. "An introduction to regional economics." 2d ed. New York, Alfred A. Knopf, Inc. 1975. 395 p.

<sup>2/</sup>The forest products industry is comprised of (1) lumber and wood products (SIC 24), except mobile homes (SIC 2451); and (2) wood furniture manufacturing (SIC 2511, 2512, 2517, 2521, 2541) and paper and allied products manufacturing (SIC 26).

## Geographical Importance of the State's Forest Products Industry

The contribution of the forest products industry to Alabama's economic base—employment basis—varies considerably between sub-State districts (see appendix 2 for a listing of counties by district). Generally speaking, the forest products industry is more important in the western half of the State. Dependency on the forest products industry to produce exports remained the same or increased in most sub-State districts between 1970 and 1980.



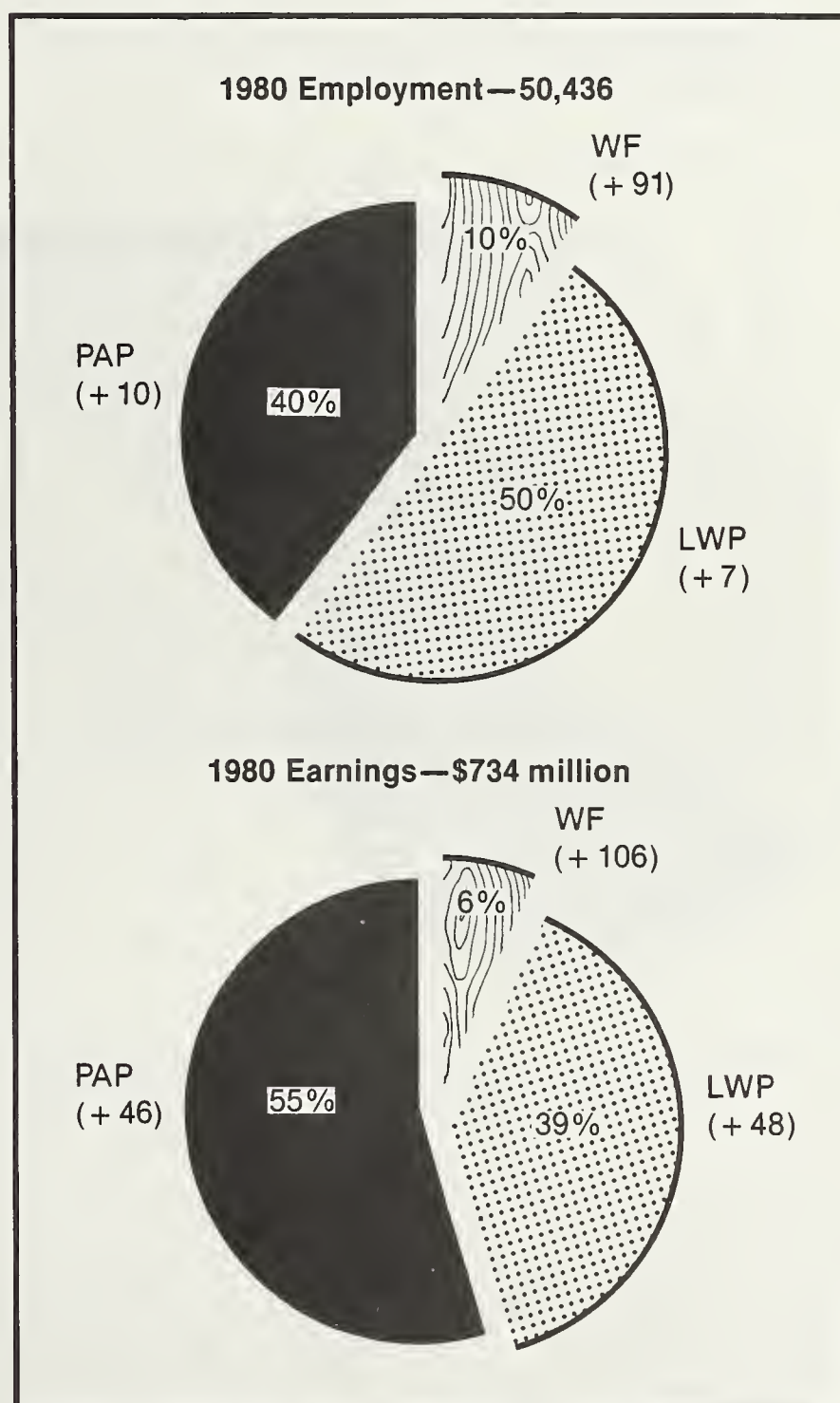
Source: Sub-State estimates for 1970 and 1980 were derived from unpublished county data series provided by the U.S. Department of Commerce, Regional Economic Information System, Washington, DC; and from the Department's *County Business Patterns*. The numbers in the squares and circles used to designate sub-State districts correspond to the geographical classification of counties as shown in appendix 2.



## Composition of the State's Forest Products Industry

Alabama's forest products industry is comprised of paper and allied products, lumber and wood products (not including mobile homes), and wood furniture manufacturing. In 1980, lumber and wood products accounted for the largest share of approximately 50,000 workers employed by Alabama's forest products industry. Paper and allied products, however, had the largest share of 1980 earnings.

Employment in all three segments of Alabama's forest products industry increased between 1970 and 1980. In fact, wood furniture employment nearly doubled. Nevertheless, wood furniture manufacturing remains the smallest segment of the State's forest products industry. During this period, earnings more than doubled for the entire industry. Earnings in all three segments of the State's forest products industry increased much more rapidly than the average for all U.S. industries (27.4 percent). In fact, only two States in the South—Oklahoma and Texas—experienced more rapid growth in FPI earnings.



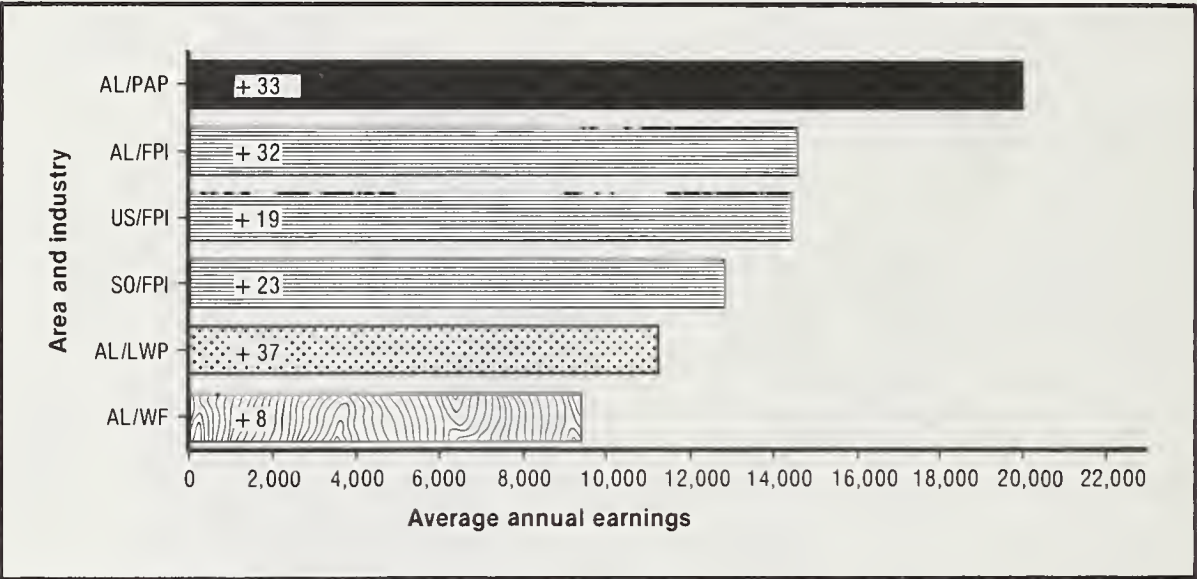
Numbers in parentheses show percentage of change from 1970 to 1980.



**Average Annual  
Earnings per Worker**

Average annual 1980 earnings per worker in paper and allied products were significantly greater than were earnings in the other two segments. Higher average skill levels, higher capital investment per worker, and unions account for this difference. Earnings in the wood furniture industry were less than half of those for paper and allied products and significantly below the average for all forest products industries in the South and the United States.

Average annual forest products industry earnings in Alabama were nearly the same as the average for the United States. However, growth in earnings was much greater for Alabama than for the South and the Nation. Growth of earnings for lumber and wood products was over a third greater than the average for the forest products industry in the South and the Nation.

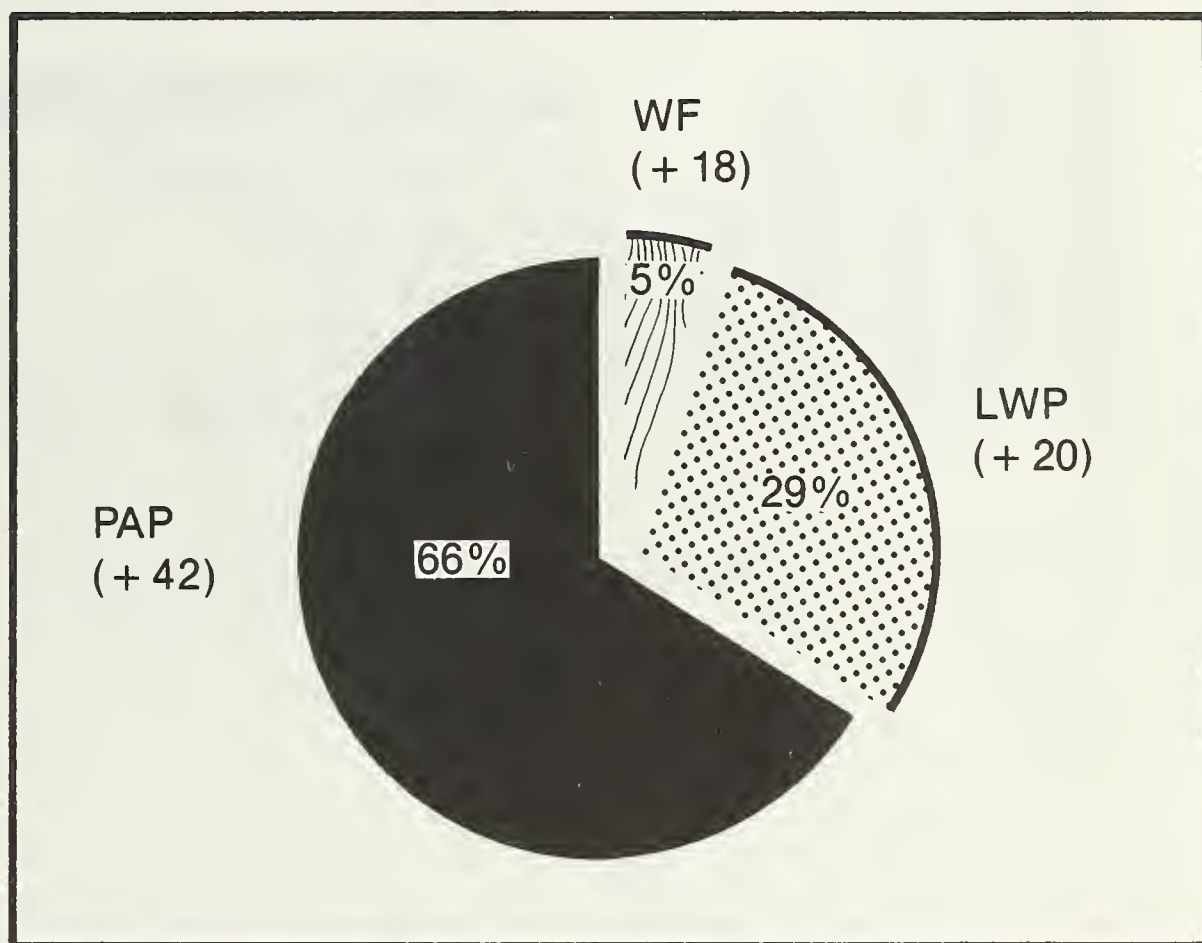


Numbers in bars show percentage of change from 1970 to 1980.

### Value Added by the Forest Products Industry

Value added by manufacturing represents income payments made directly to workers and business owners. It is equal to the value of shipments less the cost of materials, parts, supplies, fuel, goods purchased for resale, electric energy, and contract work. Unlike value of shipments, value added includes only the economic contributions of the forest products industry. Consequently, value added by manufacturing is considered the best monetary gauge of the relative economic importance of a manufacturing industry.

In 1977, the paper and allied products segment accounted for two-thirds of the \$14.6 billion of the value added by Alabama's forest products industry. Between 1972 and 1977, the value added by paper and allied products grew more than twice as rapidly as that of wood furniture and lumber and wood products segments.

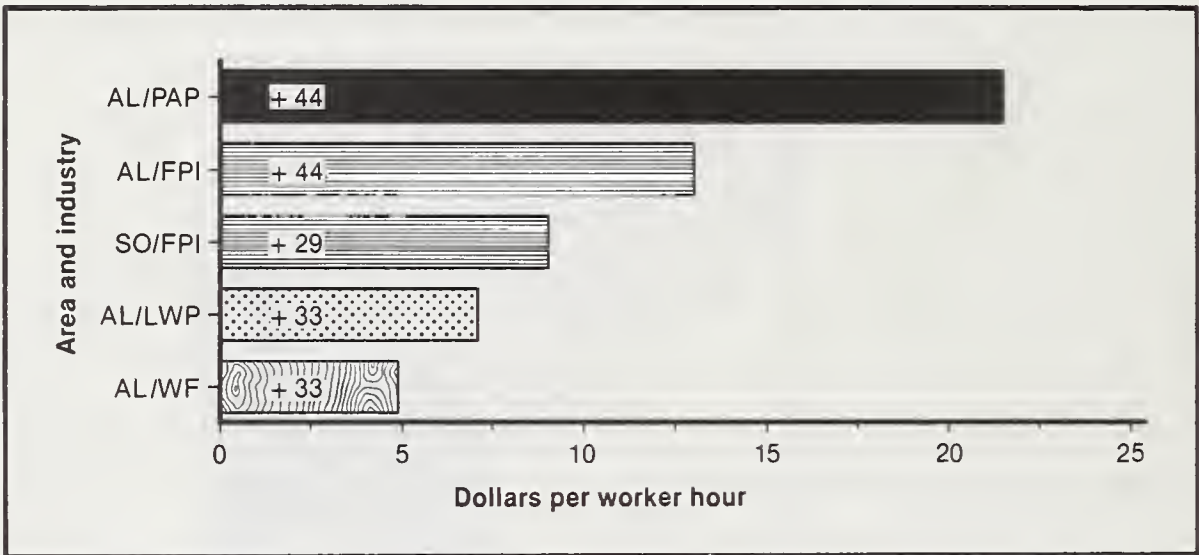


Numbers in parentheses show percentage of change from 1972 to 1977.

**Capital Productivity**

Increases in productivity are necessary for an industry to remain competitive in the marketplace. Capital productivity of an industry is measured in terms of value added less payrolls per worker hour—VAMP (see table 3 for an explanation of how capital productivity was calculated for Alabama’s forest products industry). This measure of productivity adjusts for wide differences in payroll among industries and represents the return to capital investment and entrepreneurship.

Not surprisingly, paper and allied products had the highest productivity in Alabama’s forest products industry. This segment is more capital intensive and in the past has attracted considerable investment in new facilities and equipment. Furthermore, during the mid-1970’s, this segment exhibited a larger gain in productivity than did either wood furniture or lumber and wood products.



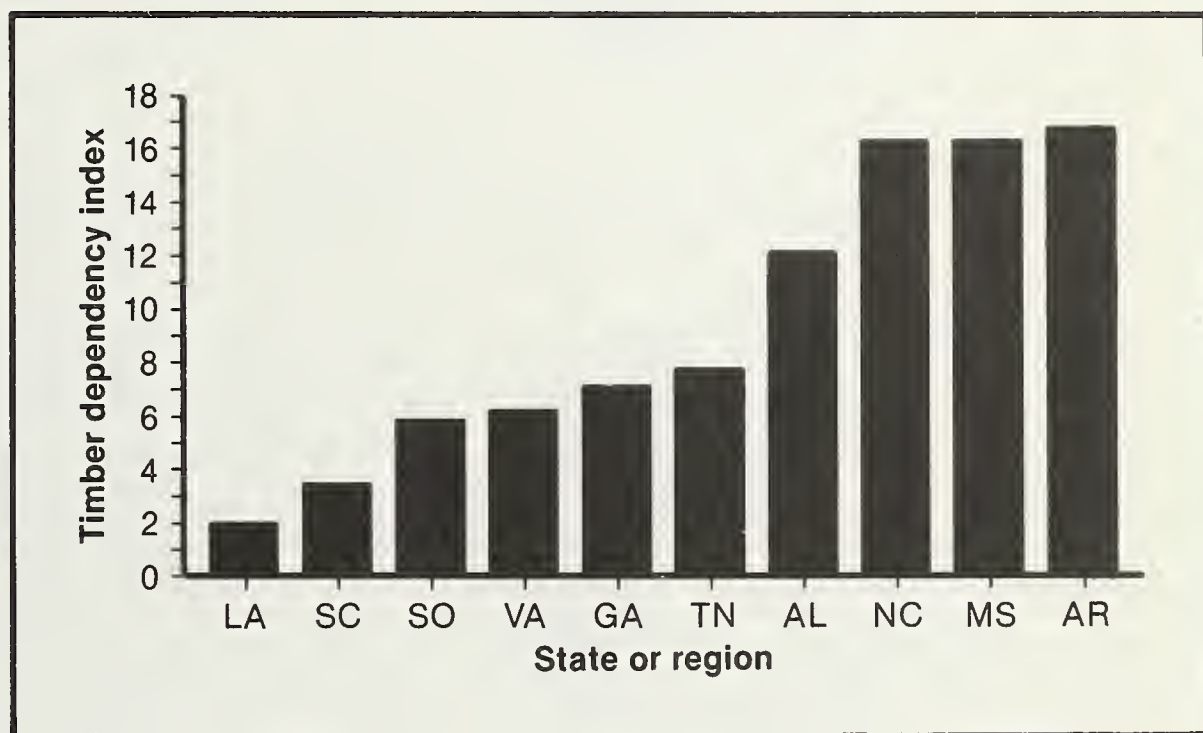
Numbers in bars show percentage of change from 1972 to 1977.



## The Forest Products Industry in the South

### Importance of the Industry Across the South

The dependency indicators suggest that in 1980 all but four States in the South manufactured forest products in excess of statewide needs. Florida, Oklahoma, Kentucky, and Texas were not self-sufficient with respect to forest products. Consequently, on net balance, their respective forest products industries did not generate new dollars from outside. In Alabama, the forest products industry accounts for approximately 1 out of 8 employees in the basic sector. In three other Southern States—Arkansas, Mississippi and North Carolina—it accounts for approximately 1 out of 6 basic employees.



## Industry Composition

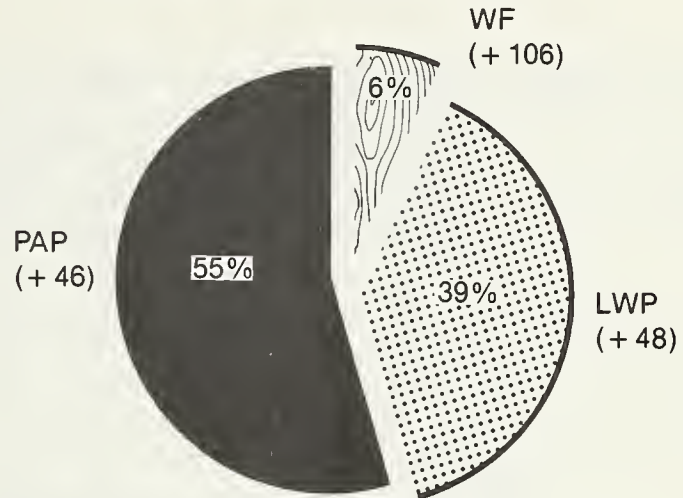
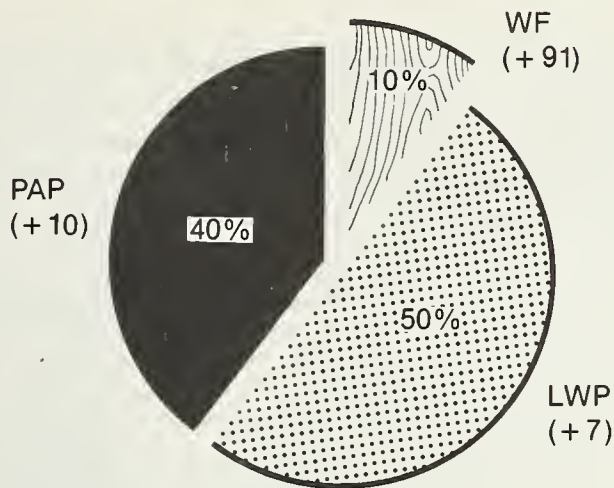
Lumber and wood products accounted for a larger share of Alabama's 1980 forest products industry employment than it did for either the South or the Nation. Paper and allied products manufacturing was more important in Alabama than in the South in terms of total employment. Employment growth, however, was faster in the South. Although paper and allied products was less important in Alabama than for the Nation, employment growth in Alabama was much greater.

In terms of total earnings, the composition of Alabama's forest products industry resembled the Nation. But growth in earnings in all of Alabama's forest products industries exceeded the average for their counterparts in the South and the Nation.

### ALABAMA

1980 Employment—50,436

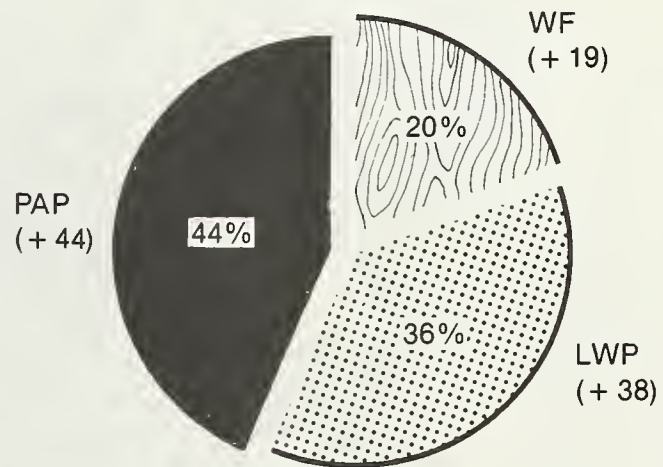
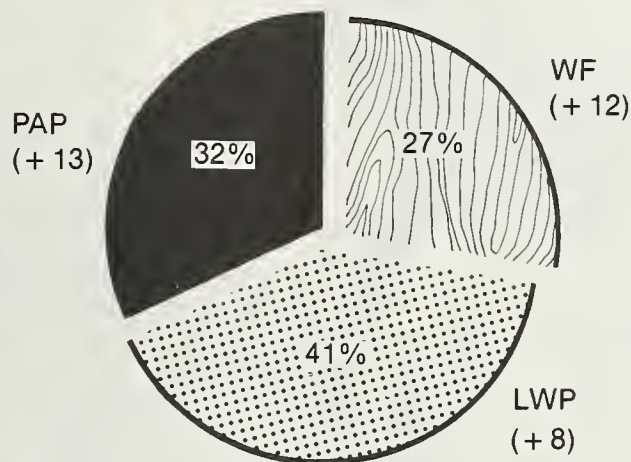
1980 Earnings—\$734 million



### THE SOUTH

1980 Employment—620,567

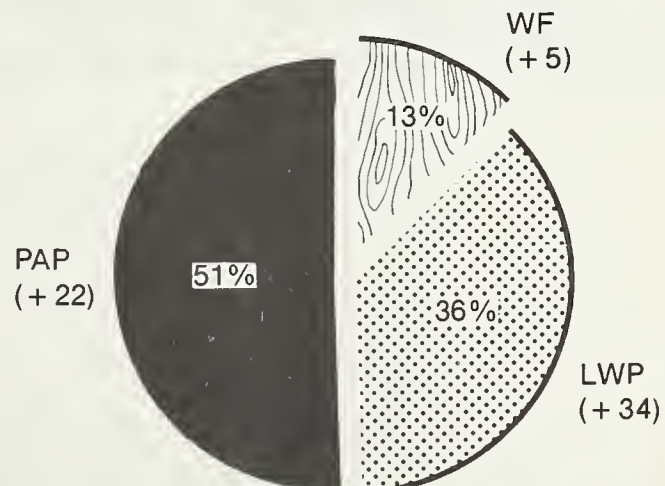
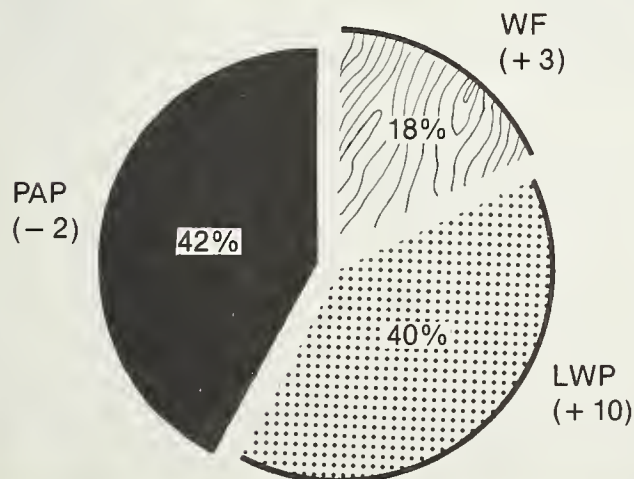
1980 Earnings—\$7.96 billion



### UNITED STATES

1980 Employment—1,634,000

1980 Earnings—\$23.65 billion

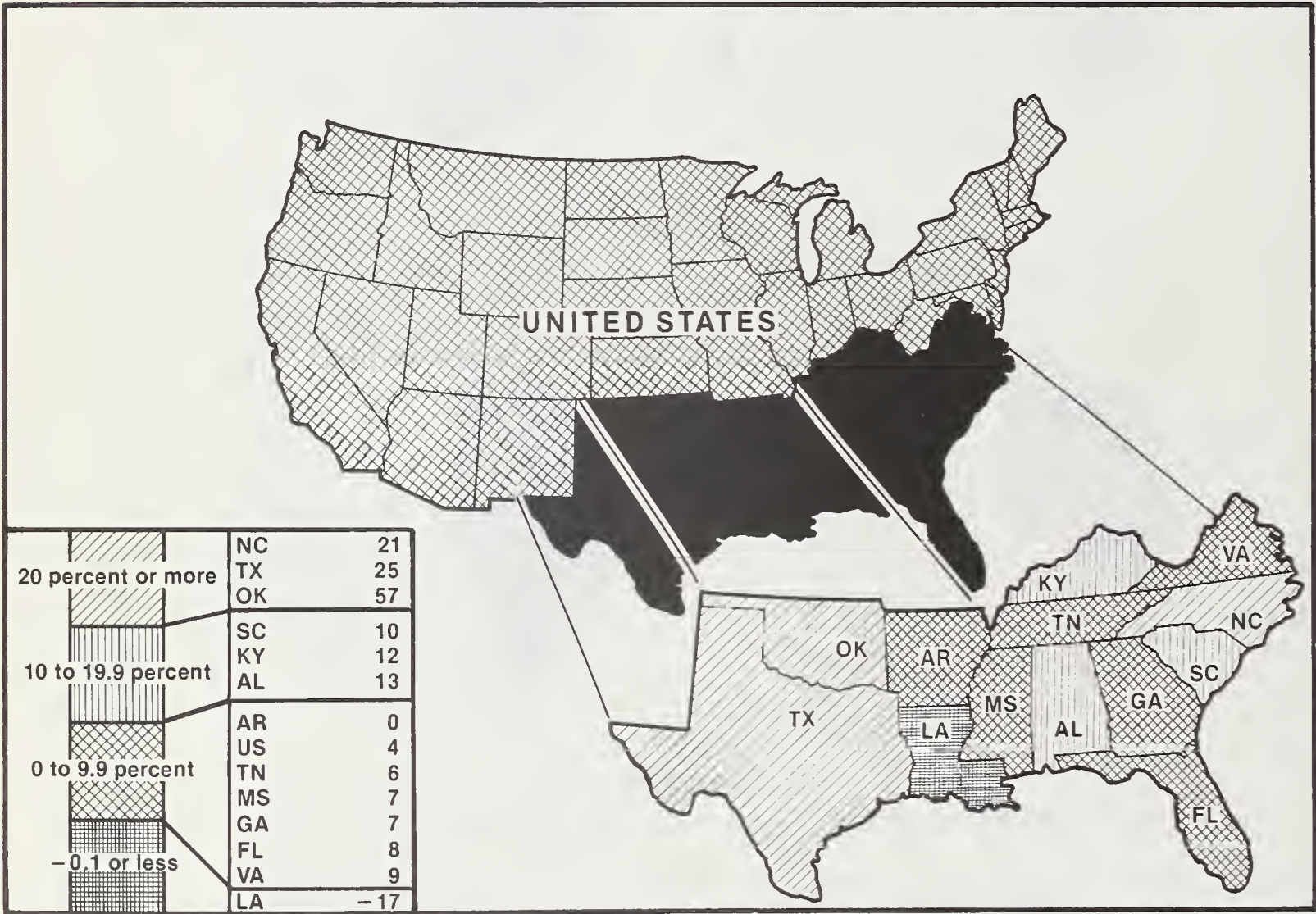


Numbers in parentheses show percentage of change from 1970 to 1980.



Growth of Employment

With the exception of Arkansas and Louisiana, forest products industry employment in each of the Southern States grew faster than did the U.S. counterpart. Employment in two States—Oklahoma and Texas—grew faster than the all-industry average of 22.3 percent. Employment growth in Alabama's forest products industry was over three times the national rate and ranked fourth among the 13 Southern States.

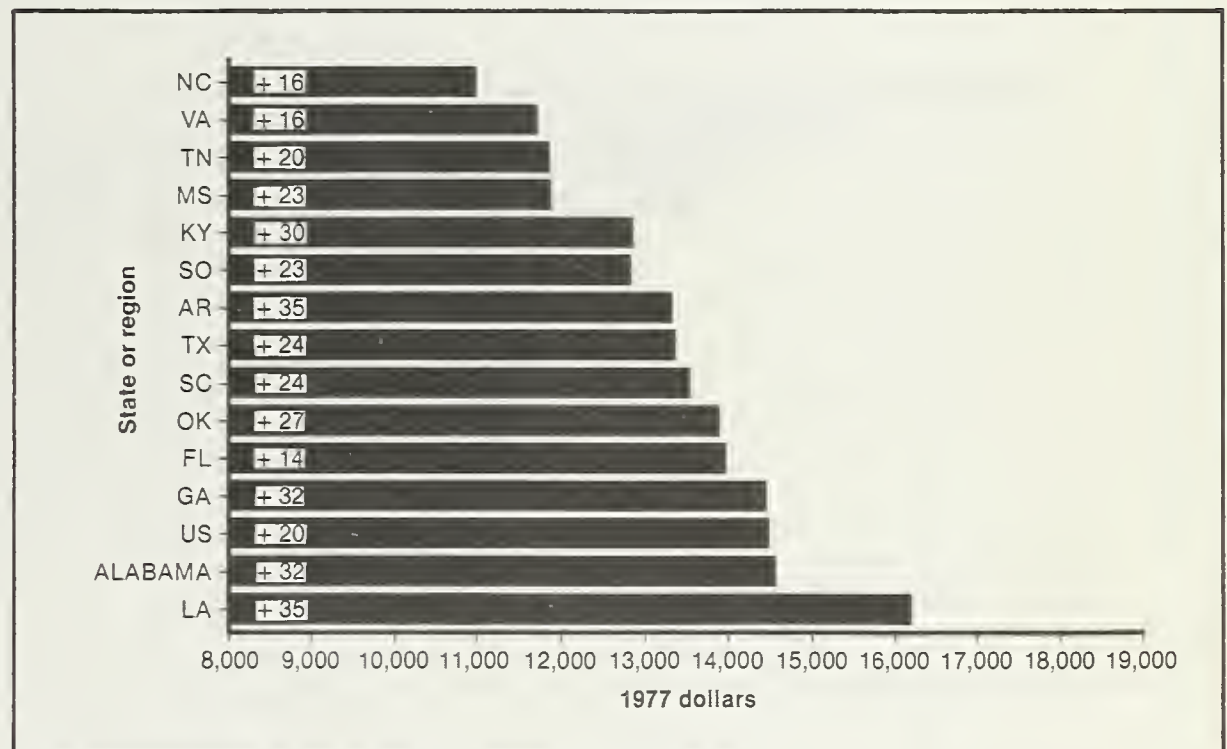


## Average Annual Earnings

Average annual earnings per worker in the forest products industry differed significantly by State in 1980: Approximately \$5,000 separated the State with the highest—Louisiana—from the State with the lowest—North Carolina. Pulp and allied products manufacturing, which has traditionally paid higher wages than have other forest products industries, dominated Louisiana's forest products industry. Wood furniture, which has paid lower average wages, dominated North Carolina's industry.

Average annual earnings per worker in Alabama's forest products industry were second highest in the South. Furthermore, Alabama tied Georgia for third place in terms of growth in average annual earnings per worker. The forest products industry average annual earnings in Alabama were nearly the same as the industry's U.S. average.

Generally speaking, paper and allied products dominated the forest products industry in the States with the highest average annual earnings. This relationship reflects higher job skills and unions in the paper industry. Wages, by and large, were the lowest in those States where the labor-intensive wood furniture industry was more important.



Numbers in bars show percentage of change from 1970 to 1980.

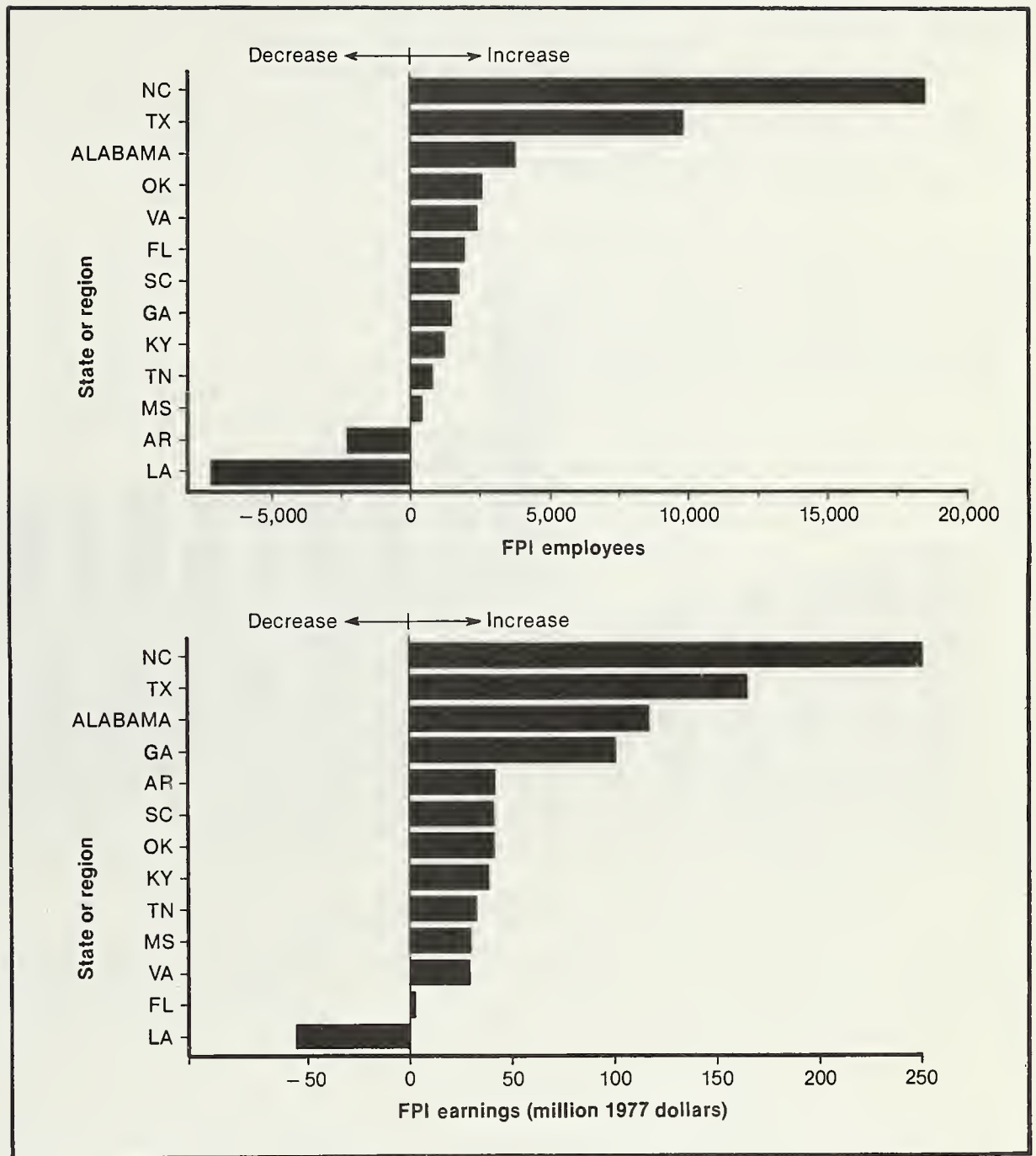
**Shift in Employment and Earnings**

The regional shift shows how much more or less employment and earnings a State would have had in the forest products industry in 1980 had it grown at the national rate. For example, Alabama had approximately 3,700 more employees in 1980 than it would have had if its forest products industry had grown at the national rate.

Between 1970 and 1980, in both employment and earnings, the forest products industry increased in every Southern State except Louisiana and Arkansas. Moreover, all but these two States increased their share of the Nation's forest products industry employment, and all States except Louisiana increased their share of earnings.

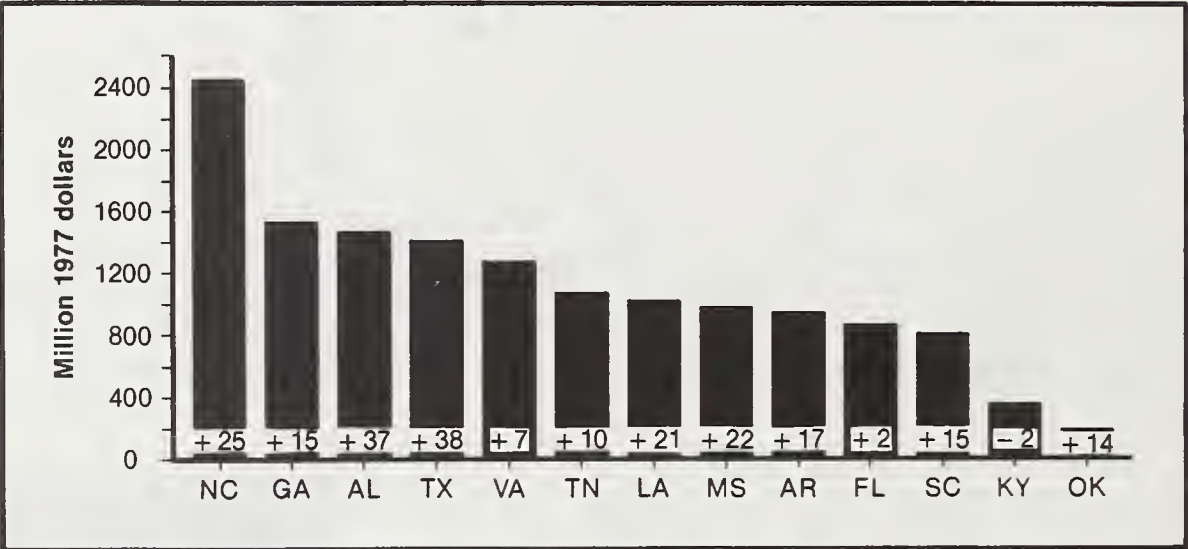
Increased shares of employment and earnings reflect the comparative advantage the South's forest products industry enjoyed over this industry in the rest of the Nation. Several factors (for example, relatively lower labor costs, lower raw materials costs, and closer proximity to markets) might account for a region's comparative advantage, although adverse trends with respect to one factor need not reduce a region's advantage. In the case of the South, for instance, increasing labor costs need not adversely affect its comparative advantage if increased capital or labor productivity offsets higher labor costs.





**Value Added by the  
Forest Products Industry**

In 1977, the forest products industry of North Carolina produced more value added than any other State in the South. Georgia was second among the 13 Southern States, followed by Alabama. Alabama was not only one of the leading States in terms of total value added, it was second only to Texas in terms of the change in value added between 1972 and 1977. One State, Kentucky, produced less value added in 1977 than in 1972.

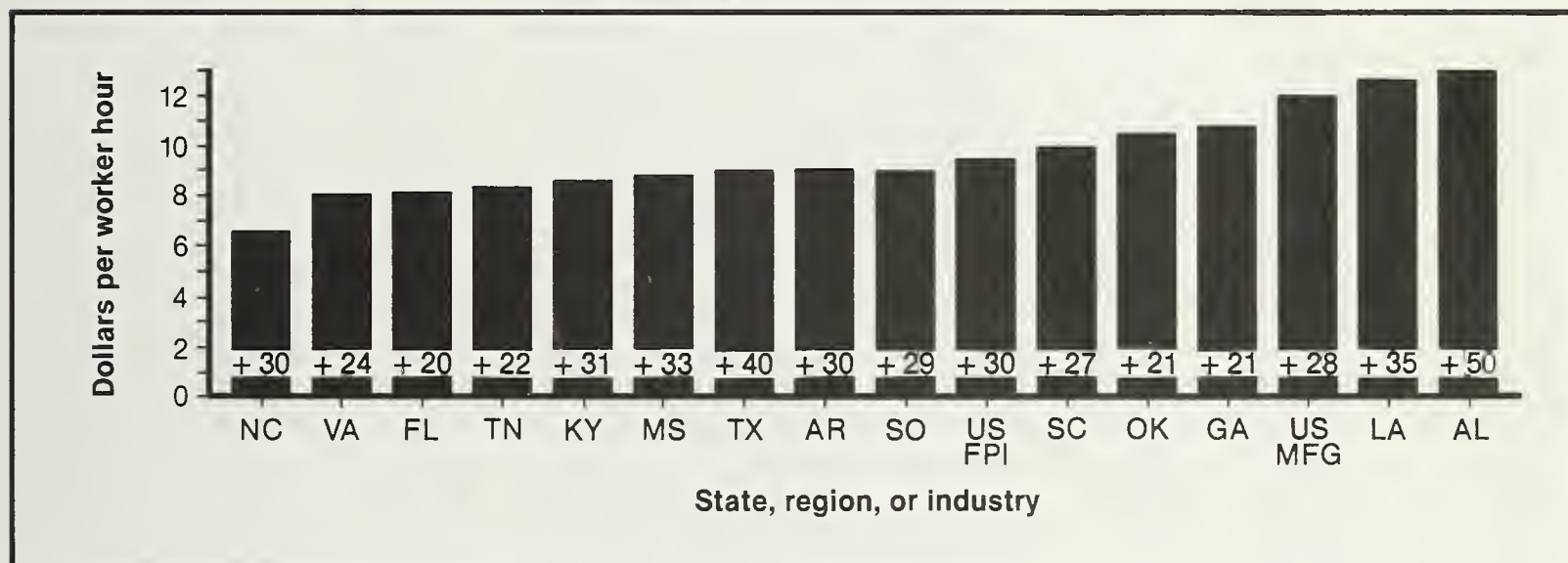


Numbers in bars show percentage of change from 1972 to 1977.

## Capital Productivity

Paper and allied products, which is more capital-intensive and, therefore, more susceptible to technological change than other segments of the forest products industry, exhibited the highest productivity within the forest products industry. Wood furniture, on the other hand, is the most labor-intensive of the three segments. North Carolina, for example, produced more value added than any other State in the South, but the productivity of its forest products industry in 1977 was the lowest. This reflects the dominant role of the labor-intensive wood furniture industry in North Carolina.

Increases in productivity exceeded increases in payroll per worker between 1972 and 1977 for all the Southern States. This relationship is in part responsible for the South's comparative advantage in the forest products industry. Alabama led the South both in productivity in 1977 and in change between 1972 and 1977. Furthermore, the productivity of Alabama's forest products industry exceeded that for the United States and the average for all manufacturing.



Numbers in bars show percentage of change from 1972 to 1977.



## Acknowledgment

Many helpful suggestions of several reviewers were incorporated in this research paper. This project was partially funded by USDA Forest Service, Resource Program and Assessment Staff, State and Private Forestry, Area Planning and Development, State Planning for Forest Resources.

## Appendix 1 Tables

**Table 1—Total labor and proprietorial employment and income, by industry, Alabama, 1980<sup>1/</sup>**

Industry number	Industry	Employees	Total income
			<i>Thousand 1977 dollars<sup>2/</sup></i>
		<i>Number</i>	
Wage and salary			
1	Agriculture	24,133	401,896
2	Agricultural services, forestry, and fisheries	6,545	64,876
3	Coal mining	12,539	322,909
4	Oil and gas extraction	1,181	26,073
5	Metal mining	101	2,127
6	Nonmetallic minerals	2,350	38,170
7	Construction	71,107	976,374
8	Food and kindred products	28,413	305,278
9	Tobacco	793	7,278
10	Textile mill production	42,916	423,243
11	Apparel and other textiles	54,134	371,124
12	Paper and allied products	20,020	400,549
13	Printing and publishing	10,076	116,762
14	Chemical and allied products	15,574	288,436
15	Petroleum refining	1,553	31,728
16	Rubber and miscellaneous plastics	14,647	245,590
17	Leather and leather products	198	1,979
18	Lumber and wood products, except mobile homes	25,408	286,172
19	Mobile homes	2,814	31,694
20	Wood furniture	5,008	47,007
21	Other furniture and fixtures	2,955	27,737
22	Stone, clay, and glass products	9,907	141,939
23	Primary metals	39,304	829,326
24	Fabricated metals	25,398	344,508
25	Machinery, excluding electrical	15,844	215,860
26	Electrical machinery	18,486	227,491
27	Transportation equipment, except motor vehicles	15,993	278,508
28	Motor vehicles	7,256	128,039
29	Ordnance	<sup>3/</sup>	<sup>3/</sup>
30	Instruments and related equipment	3,154	35,243
31	Miscellaneous manufacturing	4,740	49,896
32	Railroad transportation	7,627	152,387
33	Trucking and warehousing	19,697	308,505
34	Local transit	1,503	15,114

See footnotes at end of table.

**Table 1—Total labor and proprietorial employment and income, by industry, Alabama, 1980<sup>1/</sup> (continued)**

Industry number	Industry	Employees	Total income
		<i>Number</i>	<i>Thousand 1977 dollars<sup>2/</sup></i>
Wage and salary			
35	Air transportation	1,173	18,869
36	Pipeline transportation	92	1,692
37	Transportation services	944	15,162
38	Water transportation	3,824	59,082
39	Communications	21,378	394,033
40	Electrical, gas, and sanitation services	15,776	292,796
41	Wholesale trade	72,440	1,042,624
42	Retail trade	200,874	1,534,919
43	Banking	20,056	208,947
44	Other credit agencies	9,736	133,533
45	Insurance	20,081	314,285
46	Real estate and combinations	9,253	112,655
47	Hotel and other lodging	10,243	61,666
48	Personal, miscellaneous business, and repair services	44,587	430,003
49	Auto repair service	7,788	98,400
50	Amusement	5,624	34,318
51	Motion pictures	1,255	5,972
52	Private households	59,469	135,595
53	Medical and other health	66,797	882,469
54	Private education	12,505	92,271
55	Nonprofit organizations	35,227	201,895
56	Miscellaneous services	14,086	310,769
57	Federal civilian	65,445	1,067,464
58	Federal military	53,485	341,092
59	State and local government	231,119	2,009,163
Proprietorial			
60	Farm proprietors	72,341	329,199
61	Nonfarm proprietors	105,683	1,059,397
	Total	1,672,655	18,332,088

<sup>1/</sup> Source of data for this table for Alabama, other States of the South, and the United States: unpublished data, U.S. Department of Commerce, Regional Economics Measurements Division, Regional Economic Information System (REIS), Washington, DC, 1982. Unpublished data used by the U.S. Department of Commerce in preparing their *County Business Patterns* (CBP) series on employment and payroll were used to differentiate wood-related from nonwood-related employment and earnings. For example, CBP data were used to separate mobile homes (no. 19, above) from the lumber and wood products (no. 18) industry. Wood furniture (no. 20) was similarly separated from other furniture and fixtures (no. 21).

<sup>2/</sup>The Personal Consumption Expenditures (PCE) deflator, 1977 = 100, was used to deflate actual dollars.

<sup>3/</sup>Included with fabricated metals and other related industries.

**Table 2—Calculation of 1980 dependency indexes for Alabama<sup>1/</sup>**  
(In percent)

Industry	Employment		Alabama excess employment <sup>2/</sup>	Dependency index <sup>3/</sup>
	Alabama	United States		
Agriculture	1.75	1.46	0.28	1.85
Agricultural services, forestry, and fisheries	.47	.62	—	—
Farm proprietors	5.23	3.03	2.20	14.29
Coal mining	.91	.27	.63	4.10
Oil and gas extraction	.09	.60	—	—
Metal mining	.01	.11	—	—
Nonmetallic minerals	.17	.14	.03	.22
Construction	5.14	4.74	.40	2.60
Food and kindred products	2.06	1.87	.19	1.21
Tobacco	.06	.07	—	—
Textile mill production	3.11	.93	2.17	14.10
Apparel and other textiles	3.92	1.39	2.53	16.40
Paper and allied products	1.45	.76	.69	4.49
Printing and publishing	.73	1.37	—	—
Chemical and allied products	1.13	1.22	—	—
Petroleum refining	.11	.22	—	—
Rubber and miscellaneous plastics	1.06	.80	.26	1.71
Leather and leather products	.01	.26	—	—
Lumber and wood products, except mobile homes	1.84	.71	1.13	7.32
Mobile homes	.20	.05	.15	.99
Wood furniture	.36	.32	.04	.26
Other furniture and fixtures	.21	.19	.03	.17
Stone, clay, and glass products	.72	.73	—	—
Primary metals	2.84	1.26	1.58	10.25
Fabricated metals	1.84	1.77	.06	.41
Machinery, excluding electrical	1.15	2.73	—	—
Electrical machinery	1.34	2.31	—	—
Transportation equipment, except motor vehicles	1.16	1.21	—	—
Motor vehicles	.53	.87	—	—
Ordnance			0	0
Instruments and related equipment	.23	.77	—	—
Miscellaneous manufacturing	.34	.47	—	—
Railroad transportation	.55	.58	—	—
Trucking and warehousing	1.43	1.40	.02	.16
Local transit	.11	.29	—	—
Air transportation	.08	.50	—	—
Pipeline transportation	.01	.02	—	—
Transportation services	.07	.22	—	—
Water transportation	.28	.23	.05	.30
Communications	1.55	1.48	.07	.42
Electrical, gas, and sanitation services	1.14	.90	.24	1.54
Wholesale trade	5.24	5.79	—	—
Retail trade	14.53	16.50	—	—
Banking	1.45	1.72	—	—

See footnotes at end of table.



**Table 2—Calculation of 1980 dependency indexes for Alabama<sup>1/</sup> (continued)**  
(In percent)

Industry	Employment		Alabama excess employment <sup>2/</sup>	Dependency index <sup>3/</sup>
	Alabama	United States		
Other credit agencies	.70	0.99	—	—
Insurance	1.45	1.89	—	—
Real estate and combinations	.67	1.16	—	—
Hotel and other lodging	.74	1.20	—	—
Personal, miscellaneous business, and repair services	3.23	4.69	—	—
Auto repair service	.56	.63	—	—
Amusement	.41	.84	—	—
Motion pictures	.09	.24	—	—
Medical and other health	4.83	5.71	—	—
Private education	.90	1.47	—	—
Nonprofit organizations	2.55	3.01	—	—
Miscellaneous services	1.02	1.63	—	—
Federal civilian	4.74	3.27	1.47	9.50
Federal military	3.87	2.68	1.19	7.71
Nonfarm proprietors	7.65	7.66	—	—
Total <sup>4/</sup>	100.0	100.00	15.43	100.00

<sup>1/</sup>For an explanation of the excess employment and other techniques for identifying basic industries, see Edgar M. Hoover. 1975. "An Introduction to Regional Economics." 2d ed. New York, Alfred A. Knopf, Inc. 395 p.

<sup>2/</sup>U.S. employment minus Alabama employment. Figures may not be exactly equal to Alabama minus U.S. because of rounding. Dashes signify no excess employment.

<sup>3/</sup>Individual industry excess employment expressed as a percentage of Alabama's total excess employment (sum of column 4).

<sup>4/</sup>Sum of parts may not equal totals because of rounding.

**Table 3—Value added, hours worked, payroll, and capital productivity,<sup>1/</sup>**  
**Alabama forest products industry, 1977<sup>2/</sup>**

Industry	Value added	Payroll	Hours worked	Productivity	Productivity change, 1972-77
	- - \$Million - -		Million	\$VAMP per hour	Percent
Lumber and wood products	429.0	183.0	34.9	7.05	33.41
Wood furniture	67.1	32.8	7.0	4.90	33.30
Paper and allied products	966.3	299.2	31.0	21.52	43.56

<sup>1/</sup>Productivity equals value added (VAMP) minus payroll divided by hours worked. For a discussion of VAMP, see W. Charles Sawyer and Joseph A. Ziegler. 1980. "The use of VAMP shift as a predictive model." Unpublished paper presented at the annual meeting of the Western Regional Science Association, Monterey, California.

<sup>2/</sup>Source: U.S. Bureau of the Census, Census of Manufacturing, for 1972 and 1977, Alabama and the United States, available in 1976 and 1980, respectively. In the few instances where data were not available for some subindustry sectors, the distribution of the number of establishments was used to estimate nondisclosures.

**Appendix 2**  
**Alabama Counties by**  
**Sub-State Planning and**  
**Development Districts**

District code	Counties
1	Colbert, Franklin, Lauderdale, Marion, Winston
2	Bibb, Fayette, Greene, Hale, Lamar, Pickens, Tuscaloosa
3	Blount, Chilton, Jefferson, St. Clair, Shelby, Walker
4	Calhoun, Chambers, Cherokee, Clay, Cleburne, Coosa, Etowah, Randolph, Talladega, Tallapoosa
5	Bullock, Butler, Crenshaw, Lowndes, Macon, Pike
6	Choctaw, Clarke, Conecuh, Dallas, Marengo, Monroe, Perry, Sumter, Washington, Wilcox
7	Barbour, Coffee, Covington, Dale, Geneva, Henry, Houston
8	Baldwin, Escambia, Mobile
9	Autauga, Elmore, Montgomery
10	Lee, Russell
11	Cullman, Lawrence, Morgan
12	De Kalb, Jackson, Limestone, Madison, Marshall

**Maki, Wilbur R.; Schallau, Con H; Foster, Bennett B.; Redmond, Clair H.**

Alabama's forest products industry: performance and contribution to the state's economy, 1970 to 1980. Res. Pap. PNW-361. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station; 1986. 22 p.

Employment and earnings in Alabama's forest products industry, like those of most Southern States, grew significantly between 1970 and 1980. The forest products industry accounted for a larger share of the State's economic base in 1980 than in 1970. Of the 13 Southern States, only 5 had more forest products industry employment than Alabama. Moreover, during this period, the State increased its share of the Nation's forest products industry employment and earnings. Paper and allied products had the highest productivity and experienced the largest increase in productivity between 1972 and 1977.

Keywords: Forest products industries, economics (forest products industries), Alabama.

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